CLAIMS

1. An internal combustion rotary engine characterized by comprising two rotors, one inside the other, rotating in the same direction and at the same number of revolutions on two non concentric axes.

2. The rotary engine according to claim 1, characterized in that the eccentricity of the two axes creates a crescent like combustion chamber, divided into four parts by four mobile elements mounted on the internal rotor, said elements consisting of two bodies that fitting continuously to the inner surface of the external rotor supply a tight seal between the parts of the chamber.

3. The rotary engine according to claim 1, characterized in that the eccentricity between the two axes is dimensioned as a function of the wanted volume of the combustion chamber defining the engine displacement.

4. The rotary engine according to claim 1, characterized in that the external rotor comprises also the functions of head including the timing system, the intake and discharge valves and the spark plugs.

5. The rotary engine according to the preceding claims, characterized by means to deviate the gases to a tangential direction in the discharge valves, generating a torque on the rotors adapted to cause a second thrust level on the axis.

6. The rotary engine according to the preceding claims, characterized by providing a nozzle immediately downstream each discharge valve, adapted to generate a further third level tangential thrust by the rapid and additional expansion inside it of the overheated gases deviated in the discharge valve, so as to produce a further torque on the rotor system.

7. The rotary engine according to the preceding claims, characterized in that the internal rotor comprises the injection pump and the injectors.

8. The rotary engine according to the preceding claims, characterized in that the intake and discharge valves are in turn rotating being governed with two motions, of which a first small motion along the valve axis, adapted to detach the valve from the sealing housing and a second rotary motion adapted to put alternately the open side and the closed side in front of the intake and discharge ports.

9. The rotary engine according to claim 8, characterized in that the axis of rotation of the intake and discharge valves is parallel to the rotor axes.

10. The rotary engine according to claim 8, characterized in that the intake valve has a frustum conical hollow shape with open bottom and provided with a

longitudinal slot having a width and length equal to the discharge port of the chamber.

11. The rotary engine according to claim 8, characterized in that the discharge valve has a shape like the intake valve but with closed bottom and in the portion in contact with the discharge port of the combustion chamber has a longitudinal cavity with parabolic section.

12. The rotary engine according to claims 8-11, characterized in that said intake and discharge valves are actuated as a couple by a camshaft, each valve being actuated by three cams, the central one moving the valve in an axial direction to detach it from the contact and sealing surface of the rotor intake or discharge port, while the couple of the side cams acts shortly thereafter on a valve driving member that with its movement will cause the detached valve to rotate in the opening and closing direction and immediately thereafter the central cam terminates its action and the valve pushed by a return spring, returns in contact with the discharge or intake port to ensure its tightness.

13. The rotary engine according to claim 2, characterized in that the two bodies of the mobile elements separating the combustion chambers comprise a planet member mounted on the internal rotor, which is reciprocated and pushed outwards by a central spring, and a satellite member of a curved shape, fixed at the end of the planet and oscillating around its axis, adapted to act as a compression ring continuously fitting to the inner surface of the external rotor.

14. The rotary engine according to the preceding claims, characterized in that the steady seal between internal and external rotor is obtained by compression rings mounted on the curved convex faces of the internal rotor and on the planet in addition to the satellite rubbing contact.

15. The rotary engine according to the preceding claims, characterized in that the engine cooling is obtained through a forced circulation generated by a system of fins made in the body of the external rotor, forcing air circulation inside the engine and to the radiator, as well as by the cool lubricating oil returning from the radiator.